10%. Their effect on grain yield structure is presented below.

Gaeumannomyces graminis var. Tritici reduced productive tiller number in winter wheat variety Krasnodarskaya 99 by 23.5%, plant height – by 32.3%, ear length – by 19.1%, number of spikes per ear - by 14.4% and TKW – by 45.5%. *Fusarium* fungi reduced the same figures by 18.5, 23.1, 42.2, 31.7 and 39.5% respectively; and *Rhizoctonia* – by 45.9, 15.4, 16.2, 5.6 and 19.5%.

As seeds were treated with Premis200 before sowing (0.2 l/t) the proportion of rot causing agents changed: *Gaeumannomyces* – 47,1%, *Fusarium* – 52,0%., while the reduction in yield components changed within the experimental error.

Pre-sowing treatment of the seeds with a mixture of lignogumat and Premis200 (0.2 l/t) increased root weight of winter wheat plants compared to the control variant where seeds were treated neither with disinfectants nor with bioactive substances.

As winter wheat varieties Leukurum and Moskvich were treated with Premis200 only under artificial infection conditions their root weight increase was 2-11% lower than when they were treated with both Premis200 (application rate decreased by 30%) and lignogumat. While in the varieties Vostorg and Voronezhskaya 95 application of Premis200 decreased root weight by 14-7%.

In those variants where only Premis200 was used both were observed increase in root system damage by 23.8% (variety Fortuna) and decrease by 54.6% (variety Deya). When both chemicals were used (Premis200 (application rate decreased by 30%) and lignogumat), root system damage either remained unchanged (varieties Tanya and PalPich) compared to that of the control, or decreased by 12.5% (variety Pamyat) – 60-66% (varieties Vostorg, Yubilejnaya 100, Doka).

As winter wheat varieties Tanya, Yubilejnaya 100 and Voronezhskaya 95 were treated with Premis200 only, the increase in their root weight under artificial *Rhizoctonia* infection lowered by 5-10%, while complex treatment of the seeds with both Premis200 (application rate decreased by 30%) and lignogumat caused increase of root weight by 1-5%.

In those variants where only Premis200 was used both were observed increase in root system damage by 55.6% (variety Deya) and decrease by 81.9% (variety Moskvich). After complex treatment of the seeds with both chemicals (Premis200 (application rate decreased by 30%) and lignogumat), root system damage either increased by 9 (variety Fortuna) – 36.4% (variety Pamyat) compared to that of the control, or decreased by 27.3% (variety Nota) – 72.8% (variety Moskvich).

BLOOD PLASMA FREE FATTY ACIDS COMPOSITION IN METABOLIC SYNDROME PATIENTS

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A metabolic syndrome (MS) involves a variety of systemic clinical-biochemical processes – insulin resistance, abdominal obesity, arterial hypertension, dislipidemy [8, 9]. The MS origin has been studied insufficiently; the risk factors and pathological processes leading to this syndrome development remain disputable. There are some MS development hypotheses offered, from which the leading one is the theory of insulin resistance (IR) [7, 10]. An important role in the IR development is taken by free fatty acids (FFA). The mechanisms of glucose-insulin homeostasis and FFA interconnection predetermine the necessity to study the role of FFA and their separate components in the course of the MS formation [2, 3].

The research purpose - is to study the composition of blood plasma free fatty acids in 22 metabolic syndrome patients and 11 healthy people. The MS was diagnosed according to the criteria offered by the experts of the USA National Education Program on cholesterol [1, 12]. The investigation of carbohydrate metabolism included the glucose content determination in blood serum on an empty stomach and in 2 hours after the oral glucose load, the insulin level determination by the immunoenzyme method (the sets of the firm «DRG – diagnostics», Germany); the HOMA index was calculated (insulin on empty stomach, mUnit/ml ×glucose on empty stomach, mmol/l/22,5). The lipid exchange parameters in blood serum was determined on the biochemical analyser FP- 901M of the firm “Labsystem” (Finland) using the “Labsystem” firm sets. The A and B apolipoproteins (apo-A and apo-B) content was determined (the «DiaSys» firm sets, Germany); the apo-B/apo-A ratio was calculated. The extraction of lipids from blood plasma was executed by the method of Bly and Dyer [5]. The methyl ethers of fatty acids (FA) were obtained by the method of Carreau и Duback [6], the analysis was executed on the gas-liquid chromatograph Shimadzu GC-17A. The results were stated in relative % from the total FA sum [11].

The FFA quality composition represented by 31 components of individual fatty acids, was analyzed with due consideration of glucose-insulin homeostasis changes in the MS patients: the 1st group – MS patients with no insulin resistance, the

2nd group – patients with the diagnosed IR. In the MS patients against the background of normoinsulinemia the lauric, myristic and palmitic acids level decrease was detected, 24:0, 16:0i acids (table 1). Against the saturated FA relative amount decrease the content of polyunsaturated fatty acids (PUFA) increased. The contents of linolic (18:2ω6) and α-linolenic (18:3ω3) acids increased twice ($p<0,01$), the tendency to arachidonic acid increase (20:4ω6) was registered. The sum-total fatty acids exponent Σ ω6 increased twice. The integral change exponent in fatty acids series (unsaturation index) in the first group patients compared to the control one was higher by 41% ($p<0,05$). In the second patient group with the IR available the FFA percentage change vector was analogous, but the disorders were less vivid than in the first patient group.

The findings testify that the disorder of transport in blood and the internalization by FFA precede the insulin resistance formation. It promotes the receptor dysfunction to insulin, the signal transfer secondary system and internalization by glucose cells [2-4]. The accumulation of PUFA in plasma is probably explained by the compensatory increase of unsaturated fatty acids passive internalization by the cells when their active transport is blocked. The adaptation of cells to such polyene fatty acids transport type arouses lipolysis, intensifies insulin release resulting in hyperinsulinemia [7, 10]. The endogenic insufficiency in PUFA cells leads to the fatty acid content change of phospholipids and physical-chemical properties of plasmalemmae, their liquidness decrease, functioning failure of receptors to insulin and glucose transportation systems [3]. The findings affirm that the disorders of the receptor mediated FA transport, which result in plasmalemmae's structure changes, lie in the root of IR and hyperinsulinemia formation. Thus, a significant factor of increased risk of MS development and burdening is the FFA transport failure. The diagnostics of such failures serves a signal for the MS vicious circle development beginning that includes a complex of systemic metabolic changes concerning lipidic and carbohydrate metabolism.

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